

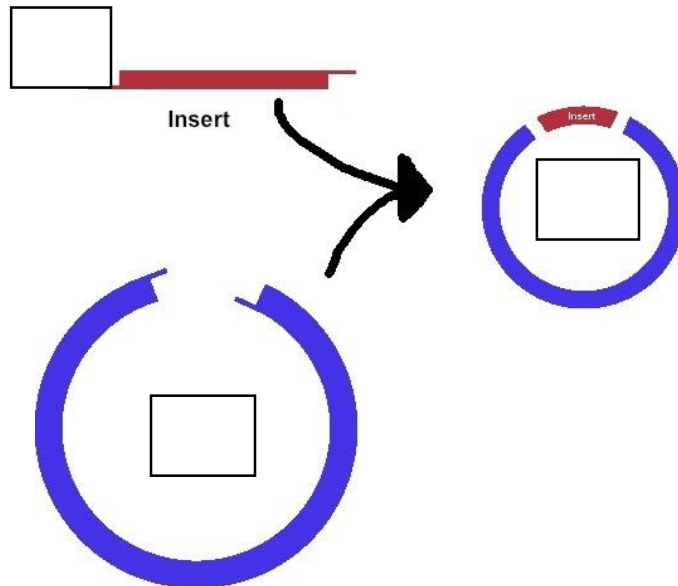
## Genetic engineering

1. **Gene Splicing**

- a. What are restriction enzymes?
  
  
  
  
  
  
  
  
  
  
- b. What is recombinant DNA?
  
  
  
  
  
  
  
  
  
  
- c. What is a transgenic organism?
  
  
  
  
  
  
  
  
  
  
- d. Genes from one organism can be inserted into a completely different organisms, such as human genes inserted into bacteria. Now the bacteria can produce the protein from the desired gene. What does this suggest about the structure of DNA in living things?

e. **Label the image by writing A, B or C in the boxes below:**

- A foreign DNA with desired gene
- B plasmid (bacterial DNA)
- C recombinant DNA



5' 3'

Bacteria Plasmid DNA

GAATCCGAAGCTCGGTACCCGGGATCCTCTAGAGTCGACCTGCAGGCATGC**A**GCCTTGGCTACCGTGTACCTG  
CTTAGGCTTCGAGCCATGGCCCCCTAGGAGATCTCAGCTGGACGTCCGTACGTT**G**AAACCGATGGCACATGGAC

5' 3'

Bacteria Plasmid DNA

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CTTAGGCTTCGAGCCATGGCCCCCTAGGAGATCTCAGCTGGACGTCCGTACGTT**G**AAACCGATGGCACATGGAC

5' Human Insulin Gene 3'

GTGCGG**AAGCTT**CCCTTACTCCAGAGCGAATTTCTGTGCATTTTCTAGGCTATA**TA**CTTCTAAAGC**TTT**CTG  
CACGGC**TTTCG**AAGGAATGAGGTTCTCGCTTAAAGAGACCAGTAAAGATCCGATATATGAAGAT**TTTCG**AAAGAC

5' Human Insulin Gene 3'

GTGCGG**AAGCTT**CCCTTACTCCAGAGCGAATTTCTGTGCATTTTCTAGGCTATA**TA**CTTCTAAAGC**TTT**CTG  
CACGGC**TTTCG**AAGGAATGAGGTTCTCGCTTAAAGAGACCAGTAAAGATCCGATATATGAAGAT**TTTCG**AAAGAC

5' Human Insulin Gene 3'

GTGCGG**AAGCTT**CCCTTACTCCAGAGCGAATTTCTGTGCATTTTCTAGGCTATA**TA**CTTCTAAAGC**TTT**CTG  
CACGGC**TTTCG**AAGGAATGAGGTTCTCGCTTAAAGAGACCAGTAAAGATCCGATATATGAAGAT**TTTCG**AAAGAC